

their contraction increase the resistance to the cardiac systole so much as to cause the greatest distress to the patient and place him in actual danger. Under such conditions my custom is to give digitalis and nitroglycerin at the same time, keeping the two drugs separate and varying the dose until the necessary driving power of the digitalis is obtained while the arterial contraction is sufficiently antagonized by the nitroglycerin.

### TREATMENT OF HIP-JOINT DISEASE.

By W. LE MOYNE WILLIS, M. D., Los Angeles.

The part in this discussion, which has been assigned to me is the operative treatment, after that by fixation and traction splints and the acute process has passed—and the complications and results of coxitis remain.

**Abscess**—Is a very frequent complication of hip disease occurring in about fifty per cent of all cases. In those cases in which appropriate treatment is instituted early, not more than twenty per cent suffer from abscess, according to Gibney. Abscess usually results in sinuses which may discharge for a time and eventually heal. A common seat of abscess in hip disease is on the upper and anterior part of the thigh, external to the femoral vessels, but they may occur elsewhere, on inner aspect of the thigh, in gluteal region, or if acetabulum is perforated, above Poupart's ligament in perineum, or open into the bladder or bowel.

In cases of hip disease of long-standing suppuration, the patient may develop progressive emaciation and amyloid changes in liver and kidneys, attended with albuminuria, and anasarca, usually soon followed by death. Abscess may form slowly or rapidly and attain such size as to interfere with wearing apparatus. When pus is diagnosed, it should be aspirated or evacuated by incision. Gibney holds that the most satisfactory results follow repeated aspiration or small incisions, followed by injection of iodoform emulsion, and closure of wound by compresses of gauze, to be repeated as often as cavity refills. The cavity and sinus, in spite of any method, will remain open and discharge until all debris is thrown off from diseased bone and cartilages. Old sinuses should be opened up and curetted, after which they will often rapidly close.

In tuberculous osteitis of the hip, when the process is limited to well defined foci surrounded by firm bone, the condition resembles that of an abscess, and drainage of such focus is desirable, when part is easily accessible, as the knee or os calcis; but when the epiphysis of femoral head or the acetabulum are attacked, it is difficult to satisfactorily drain or remove diseased tissue: it is not easy to determine by skiagram the existence of a sharply defined focus.

It has been shown by Feiss that tubercular changes may exist in bone in an early stage of development and on the borders of apparent tubercular cavities, and yet not be demonstrable in X-Ray pictures taken of living subjects, especially when taken in the deeper structures. This procedure is most satisfactory when process is near the tro-

chanter, which may be trephined or tunneled for removal of detritus or sequestra.

The operation is performed by exposing the part of bone in which the focus has been located and removing it by thorough curettage. (If in the neck or head of femur, trochanter is exposed with least amount of damage to soft parts and trochanter and neck drilled until head has been reached, or focus or pus found sooner.) The cavity, if there has been one found, after having been scraped, should be dried and wiped out with pure carbolic acid and alcohol, or two and one-half per cent solution of formalin (and wound closed all but temporary gauze wick).

**Osteotomy-Gant**—Where the joint is partially or completely ankylosed and the leg fixed at a bad angle to the trunk, correction by osteotomy of femur, will diminish deformity when walking, and give greater length to leg. Gant devised this operation in 1872, dividing the femur below trochanter minor. His method has been modified, some using the chisel, others the saw. The only instruments needed are a chisel properly tempered and wooden mallet.

(The patient aseptically prepared, on back or side, sand pillow under leg, chisel is driven into leg, cutting edge being entered in long axis of limb and turned when it pierces periosteum, and then enters the bone, at a right angle.) The chisel should be driven into bone by sharp blows with mallet. The bone should not be entirely divided and when evident that only a shell remains, very little force will make a green stick fracture, and leg be brought to a proper angle to trunk. No manipulation of bone should be made after the partial fracture. It may be necessary to divide bands of contracted fascia in upper thigh to completely extend limb. A properly protected and applied plaster spica is put on to hold the leg in corrected position. All bony prominences must be carefully padded to prevent sloughs. If plaster cast is undesirable, a bed frame with traction or a double Thomas' splint may be used. Confinement to bed for five or six weeks.

If it is desired to compensate for bone shortening, it can be done by putting the leg in an abducted position. Risks attending operation are slight. Hemorrhage is very rare, though accidents have been reported from pressure on femoral vessels by sharp edges of bone. Marked improvement in general condition often follows operation after patient leaves bed. Fixation in plaster splint should be continued six weeks longer. Fixation must not be abandoned too soon as relapse occurs.

The ultimate functional results are excellent and though there may be no motion at hip joint, the lumbar vertebræ are more movable and patient walks with less lurch and deformity. The operation is indicated in all cases of severe deformity in which the distortion seriously interferes with locomotion.

Mr. Robert Jones of Liverpool does a modification of Gant's osteotomy; instead of a chisel and mallet, he uses a pistol shaped saw whose narrow blade ends in a probe point with which he saws

through shaft of femur just below junction with neck, outside intertrochanteric line. He makes a small incision with a slender knife to the bone, passes saw through this channel and very quickly cuts through bone, breaks lower shell of femur, puts leg in best possible position to correct faulty angle, slightly abducts leg and puts patient up in a double Thomas' hip splint. Mr. Jones claims he gets better results than with chisel; that bone dust is taken care of and that end results are excellent.

**Excision of Hip Joint**—This method of treatment is based on the opinion that in a tuberculous joint lesion, repair is hastened by removal of diseased portion. Excision is less to be advocated on the hip than at the knee or ankle, because it leaves a poor joint for weight bearing purposes, and because it is difficult to remove acetabulum, frequently primarily diseased. Excision in early cases is not justified if conservative treatment can be continued for a sufficient time, and with thoroughness. The hip is more mutilated than by cure by natural process of gradual absorption and repair, which leaves a more or less ankylosed hip, consequently excision is reserved for the severer cases.

The value and efficiency of excision of the hip has been much disputed. Two of the most noted authorities on hip disease in England, Mr. Howard Marsh of the Great Ormond Street and Alexandra Hospital for hip disease in childhood, and Mr. G. A. Wright of Manchester and the Pendlebury Hospital for Sick Children take diametrically opposite views.

Mr. Marsh is strongly opposed to excision for the following reasons: He considers the results obtained by continued rest to be such as to render excision totally uncalled for. Thus continued rest gives a mortality of only five per cent. Seventy per cent of cases thus treated recovering with only slight lameness, and loss of movement. Even when suppuration has occurred, the mortality is only six to eight per cent.

On the other hand, Mr. G. A. Wright, speaking from a larger experience of over one hundred cases of excision, of which *only three* at most, died of direct result of operation, strongly urges that the hip should be excised as soon as there is evidence of external abscess, and still better results would, I believe, be obtained by operating before the pus has escaped from the articulation. The operation is discredited because it is put off until disease is so far advanced that no treatment can have more than a fraction of good results; while timely excision cuts short the disease, saves pain, lessens the time of treatment, and gives a better limb.

Again Mr. Wright says, "While fully aware that abscesses disappear, and tuberculous lesions cicatrize under favorable circumstances, I think that in case of the hip, delay is unwise amongst the hospital class, with whom it is impossible to deal on the same terms as with the well-to-do. In almost every instance, I have found much more extensive disease than might have been expected from the external evidence unless the pathology of affection is born in

mind; and I believe that once this chronic osteomyelitis is established, nothing short of excision can *in hospital cases* prevent the ultimate progress of the disease to abscess, and too often to gradual exhaustion of patient by pain and discharge. Nature, of course, in many cases will, unaided, get rid of dead bone by slow and tedious processes, but the number of children who can survive the process of elimination is very small, while the mortality after early excision is not great, and the failures are mainly in those instances where the operation has been put off too long, where actual necrosis or caries of head of the femur with destruction of bone and cartilage and sequestra of varying size in the acetabulum, or at least caries of it is known to exist. I think few advocates of non-operative treatment will be found."

With reference to such a divergence of opinion between two authorities on the subject, it should be known that Mr. Marsh worked under more favorable conditions than most hospital surgeons. At the Alexandra Hospital cases were kept under treatment as long as rest and extension were required; if an operation was required, the case was transferred elsewhere. Mr. Wright on the other hand had the usual hospital conditions, and could not prolong treatment indefinitely, and hence arrived at a different conclusion. It is largely a "class" question.

If the patient can have all the care and attention for a sufficiently long time—the conservative plan will no doubt be the better one for that case. But if, as in most hospitals, where patients are from the tenement districts, and are victims of their surroundings, the question changes into, what will prevent the greatest loss to individual in suffering, time, and afford the greatest chance for a good result with least amount of deformity and danger as to life, and such considerations make Mr. G. A. Wright, and others who agree with him and who operate on the sick and poor in large numbers, adopt the more radical method, as best for hospital cases.

The slums of London, Manchester, Boston, New York, and all other large cities furnish the great mass of cases for Children's Hospitals, and upon such cases and their treatment statistics are based. Hence one hospital's experience and statistics will differ greatly with another's, depending on the class of cases, the endowment of hospital and whether the surgeon can keep his cases as long as he wishes to secure results by the more conservative methods, before proceeding to the more radical. Men's opinions are formed by habit and by their experiences, and should be contrasted accordingly.

**Operation—Posterior Incision**—Formerly the great advantage claimed for this method was better drainage, but the choice of method should largely depend on the location of the disease in and about hip joint, whether more anterior or posterior. The posterior operation consists in making incision over middle of great trochanter, freely exposing capsule and upper end of femur. The exact position of head and neck is made out by finger while an assistant rotates the limb.

Second incision opens capsule freely; parts being properly exposed and protected, the bone is sawed through just below top of trochanter with an osteotomy, metacarpal or keyhole saw. There must be clean sawing, and no splintering of bone. The head and neck are levered out of the acetabulum. The round ligament is probably destroyed, if not it must be divided. The acetabulum is examined and if merely roughened, is left alone; if pitting or erosion present, curetting and gouging must be resorted to. Sequestra must be removed. If acetabulum is perforated, and pus on inner aspect of pelvis, a free opening must be made by trephine or gouge and a drainage tube passed through.

Drainage by iodoform gauze or a tube will be necessary in nearly all cases. In a few where there are no sinuses, nor pelvic abscess, and after all oozing has been stopped, sterilized iodoform can be rubbed in and wound closed with sutures, dressing must be applied and firm pressure maintained.

Mr. A. E. Barker has shown what excellent results the anterior method can give and among his later papers has published some most successful cases treated in later stages, where other means had failed, and abscesses were threatening to burst. Mr. Barker claims less interference with muscles, patient can be treated and wound dressed more conveniently, with a Thomas' splint. Primary union can be secured if all of diseased structures are removed; perfect asepsis secured; all oozing checked and wound kept dry by well applied dressings; absolute rest during healing—perfect drainage can be obtained, because discharges are serous. All diseased tissues have been removed and a clean walled cavity is left, which is capable of healing by first intention, and soon femur can be brought up and thus diminish size of cavity.

Mr. Barker, in *Lancet*, 1900, analyzing forty-one cases, anterior excision, as to after history speaks favorably of final result. As to functions of the limbs operated on, as seen (in all but two cases) years after they were excellent.

According to Whitman the results of excision are as follows: In the twelve years, 1888 to 1899 inclusive, 149 operations of excision were performed at the Hospital for Ruptured and Crippled. During this time 1,283 cases of hip disease were treated in the wards and 1,870 new cases were recorded in the outpatient department. Thus the operation was performed in 11.6 per cent of those in the hospital, but the relative frequency of the operation in the entire number of patients under treatment, was considerably less than this.

One hundred and twenty-one of these operations of excision, or those performed prior to 1897, have been carefully analyzed by Townsend. The 121 operations were performed on 119 patients, in two instances both hips having been operated upon. In 113, abscesses or sinuses were present, in most instances infected. In 5 cases the spine was involved as well as the hip; in two instances the knee, in 2 the tarsus, in 3 the ilium. In 24 cases the anterior incision was employed, in 97 the posterior. In 18 in-

stances the acetabulum was seriously diseased and in 10 osteomyelitis of the shaft of the femur was present. This indicates the character of the disease in the cases operated upon.

In 99 of the cases the later results of the operation were ascertained. Of these 52 were dead and 47 were living. Of the 52 deaths, 9 were due directly to the operation, shock; 28 were caused by exhaustion; 9 by tuberculous meningitis; 7 by other causes. Thirty-seven deaths occurred within six months and 10 others within one year of the operation. Of the 47 patients living at the time of the investigation 26 were cured. Of the remaining number about one-half were in poor condition so that recovery could not be expected. It is evident that in a large proportion of the cases the operation was unsuccessful as a life-saving measure since suppuration persisted.

Lovett has reported the results of 50 excisions in a similar class of cases at the Boston Children's Hospital, 1877 to 1895. The number of patients actually treated in the wards of the hospital is not stated, but 1,100 cases were recorded as having been under treatment during this time, a percentage of excisions of 4.5 of the total number. In eight of the cases osteomyelitis of the femur was present and in 15 the acetabulum was perforated. The ultimate mortality was about 50 per cent.

Poor has reported the results in 65 cases operated upon at St. Mary's Hospital, New York, with a final mortality of about 43 per cent. In 21 cases osteomyelitis of the shaft of the femur was present. In 11 cases there was perforation of the acetabulum and in 9 of these the opening communicated with an intra-pelvic abscess.

These statistics are quoted to illustrate the relative efficiency of late excision. The extent of the lesions in some of the cases shows that recovery would have been impossible without operation, and its failure to relieve the symptoms in so many instances is sufficient evidence that it was postponed too long. Under proper conditions for treatment excision of the hip is almost never required, but in hospital practice it would seem that it should be performed oftener and at an earlier stage of the disease.

#### *Conditions of success in excision of hip.*

(1) Age, from 6 to 14 years; after 18 should be rarely done, Furneaux Jordan's amputation taking its place.

(2) Absence of lardaceous disease.

(3) Absence of advancing trouble in other joints, or of tubercular lesions of viscera, e. g. lungs.

(4) The disease must be removed as completely as possible. The section in femur must pass below all foci of disease, all sinuses must be scraped out.

(5) Adequate drainage.

(6) Careful after treatment, the wound being kept aseptic.

(7) Patient must not be kept too long on his back in hospital air.

The consensus of opinion in regard to amputation seems to be, if done early that results are superior to excision, from standpoint of general improvement

and mortality. The chief drawback, however, is the resulting deformity, which can only be partially replaced by mechanical devices. Mortality in ordinary cases is no higher than in amputation of upper thigh. If on the other hand, there are large areas involved with tunneling sinuses, and great constitutional involvement, the operation is then one of last resort with an exceedingly high rate of mortality.

### INDICATIONS OF CESARIAN SECTION.\*

By A. B. SPALDING, M. D., San Francisco.

The interest of the unborn child demands attention, and its life as well as its future health should be safeguarded by the conscientious attendant. To do this one must adopt a systematic method of examination of the pregnant woman and carry it out continuously. Too often this becomes a very monotonous procedure and the practitioner falls into the convenient habit of never troubling until trouble troubles him. In this paper some conditions will be mentioned which occur fortunately rather infrequently, but when they do occur or exist tax the skill and the judgment of the attendant to the utmost. Conditions which demand interference to preserve fetal life without too much risk, to the mother, and which are met successfully by the operation of Cesarian Section in opposition to therapeutic abortion, craniotomy, induction of premature labor, version and forceps.

Cesarian Section may be necessary to meet a sudden or unlooked for emergency of pregnancy or labor or it may be the last heroic effort to save a patient from misplaced confidence in the powers of nature, or from ill-judged efforts of the attendant to utilize forceps. The mortality of this emergency or late operation is high, certainly 50 per cent for both mother and child. The indications can not be briefly stated, as each case is an obstetrical entity in itself. One thing is clear and that is that the general surgeon performs this operation not infrequently for certain conditions which are best met by other obstetrical operations. For instance, following Lawson Tait, some surgeons have operated for placenta previa, amassing even in the reported cases a maternal mortality of over 20 per cent. It is interesting to note the reason Dr. Tait gave for his original operation. In his previous experience he had had fourteen cases of placenta previa and had lost seven of the mothers in attempting version. It is obvious that Dr. Tait was a surgeon and not an obstetrician. He was browsing in the wrong pasture.

Occasionally in placenta previa as well as some cases of eclampsia accidental hemorrhage, or sudden death of the mother during pregnancy Cesarian section is indicated, but as a general rule these conditions are best treated by other operative procedures. A case of maternal death during the last month of pregnancy from edema of the lungs complicating myocarditis, in which I performed a post mortem

Cesarian section has led me to believe that to save the child one must operate while the mother is still alive. The literature also of the few reported cases seems to demonstrate that under such circumstances more babies survive when delivered through the natural passages. Other conditions of pregnancy such as cornual pregnancy, pregnancy with ovarian cyst and threatened rupture of the uterus from hysteropexy can be successfully treated at times only by Cesarian section.

The need for the emergency operation of Cesarian section during labor is usually indicative of a failure on the part of the attendant to carry out elementary principles of the practice of obstetrics. Either the patient has failed to call on her physician during pregnancy or the physician has committed the gross error of failure to properly inform himself in advance of the condition of his patient. Ascertaining these facts during labor not infrequently leads to infection, and Cesarian section in the face of infection carries with it a very high mortality.

When the operation of Cesarian section is anticipated and is the result of deliberate decision, the patient can be placed in a suitable institution and can be operated on at a time best calculated to conserve the life of mother and child. This selected operation is the ideal procedure and gives the best results. The fetal mortality should be small, and in the hands of a competent operator the maternal mortality should be less than 5 per cent.

There is an absolute indication for operation which is present whenever the disproportion between the passages and the child is so great that it is impossible to remove the fetus even after embryotomy. This is so when the true conjugate is less than five cm. or when the pelvis is blocked to an equal degree by any form of unyielding pathological growth. All other conditions which point to a probable inability on the part of nature to expel the contents of the uterus at term are included in the class of relative indications. Considerable diversity of opinion exists as to the practical value of relative indications, and Cesarian section is opposed by the supposed simpler operations of induction of premature labor, forceps, version, pubiotomy and symphyseotomy. Nature herself not infrequently demonstrates that all these procedures are necessary if the attendant will only give her time and opportunity to exert her power. The reason for this is that it is impossible to judge in advance the strength of the labor pains, the molding of the fetal head, the behavior of fibroid tumors or of cicatricial contractures of the vagina. The size of the fetal head can be only roughly estimated and the internal diameters of the contracted pelvis itself can be ascertained only with a fair degree of accuracy.

The antero-posterior diameter of the pelvic brim gives the most practical indications for the anticipation of Cesarian section. The old limit of seven and a half cm. has been gradually extended so that at present many operators consider eight and a half cm. or even nine cm. in a generally contracted pelvis as indicating the operation. It is a matter of indi-

\*Read before the San Francisco County Medical Society, September, 1907.